

**METHOD AND DISK DRIVE FOR IMPROVING HEAD POSITION ACCURACY
DURING TRACK FOLLOWING THROUGH REAL-TIME IDENTIFICATION OF
EXTERNAL VIBRATION AND MONITORING OF WRITE-UNSAFE OCCURRENCES**

ABSTRACT

1 A method is disclosed for improving head position accuracy in a disk drive during track
2 following of concentric data storage tracks through real-time identification of external vibration
3 and monitoring of write-unsafe (WUS) occurrences. In the method, after a seek operation to a
4 predetermined data storage track, the track is followed using a servo control loop having a
5 nominal gain and responsive to a position error signal (PES). After waiting a vibration detection
6 delay period, occurrences of the PES exceeding a WUS limit are counted generating a WUS
7 limit exception count. Also, a property of a variance is determined from spectral power values
8 generated from the PES during track following. If the WUS limit exception count exceeds a first
9 threshold, and if the property of the variance exceeds a second threshold, the nominal gain is
10 increased to a vibration gain within a frequency band, to attenuate the effect of external
11 vibration.